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10/540,965	08/25/2005	Takuji Higashioji	TIP-05-1179	6051

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EXAMINER
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NELSON, MICHAEL B

ART UNIT	PAPER NUMBER
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4145

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01/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/540,965	<b>Applicant(s)</b> HIGASHIOJI ET AL.	
	<b>Examiner</b> MICHAEL B. NELSON	<b>Art Unit</b> 4145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20050629</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: the density limitations on page 32, for example line 2, lack the appropriate units. No new matter shall be entered. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 15-27, the limitation on the density of the laminated film in claim 15 lacks units and therefore renders the claim indefinite. Appropriate correction is required. See MPEP § 2173.05.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Nevitt et. al (U.S. 6,268,961).

Regarding claim 1, Nevitt et. al discloses a laminated film comprising at least two film layers, wherein

- at least one of the film layers contains a thermoplastic resin composition and is biaxially oriented and

(See C5, L61-67, the first and second optical layers are disclosed as being biaxially oriented. Also, see C6, L33-39, the resin used in the first and second optical layers is disclosed as polyethylene naphthalate (PEN), which is a polyester polymer and is a thermoplastic polymer.)

- at least another one of the film layers includes a network structure.

(See C2, L28-32, the particle containing layer is a film layer including a network structure. The network structure is made up of the particles in the particle containing layer.)

Regarding claim 2, Nevitt et. al discloses all of the claimed limitations as set forth above. Additionally the reference discloses a laminated film wherein the biaxially oriented film layers containing the thermoplastic resin composition are placed on both faces of the network structure-including film layer.

(See Fig. 4, the thermoplastic resin composition layers, [122] and [124] (the first and second optical layers (C5, L40-45)), are oriented on both faces of the network structure including film layer, which is the middle layer comprising [130] and [132] ([130] is an interior non-optical layer (C1, L40-50) and [132] is particles (C9, L22-25)) ).

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Regarding claims 3, 5, and 6, Nevitt et. al discloses all of the claimed limitations as set forth above. Additionally the reference discloses a laminated film

- wherein the network structure-including film layer contains a non-ductile resin composition

(See C6, L61-67. The polyether imide copolymer with polyester, is a non-ductile resin composition. Also poly-ethylene naphthalate (C6, L33-39), copolymer of polyethylene terephthalate and polyethylene (C6, L60-67), polystyrenes (C7, L40-45), polysulfones (C7, L41-45) and polycarbonates (C7, L45-50) are non-ductile resin compositions. All the above mentioned non-ductile resin compositions are listed as possible resins for the first and second optical layers (C5, L62-C7, L65). Also, see C7, L65-C8, L14, the non-optical layers, including the interior non-optical layer [130], are disclosed as being made of the same resin as the first and second optical layers (C7, L10-14). The interior non-optical layer is disclosed as containing particles (Fig. 4, [130] and [132]) and is therefore a network structure-including film layer containing a non-ductile resin composition.)

- wherein the network structure-including film layer further contains non-liquid-crystalline polyester. (claim 5)

(See C6, L61-67, polyether imide copolymer with polyester, disclosed as a resin for the interior non-optical layer [130] (C5, L62-C7, L65), is a non-liquid crystalline polyester)

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- wherein the non-liquid-crystalline polyester is polyethylene terephthalate, polyethylene naphthalate, or a derivative of one of these polyesters. (claim 6)

(See C6, L61-67, poly-ethylene naphthalate (C6, L33-39) and copolymer of polyethylene terephthalate and polyethylene (C6, L60-67) are disclosed as resins for the interior non-optical layer [130] (C5, L62-C7, L65). These polymers are of list in the instant claim 6.)

Regarding claim 4, Nevitt et. al discloses all of the claimed limitations as set forth above. Additionally the reference discloses a laminated film wherein the network structure-including film layer contains a liquid- crystalline polymer.

(See C13, L1-L15, the particles, which make up the network structure, can be made of liquid crystal polymers (C13, L9).)

Regarding claim 11, Nevitt et. al discloses all of the claimed limitations as set forth above. Additionally the reference discloses a laminated film wherein the thermoplastic resin composition contained in the biaxially oriented film layers contains at least one selected from the group consisting of polyester, polyphenylene sulfide, polyether imide, polycarbonate, polyether ketone, polyethersulfone, polysulfone, and polylactic acid.

(See C5, L61-67, the first and second optical layers are disclosed as being biaxially oriented. Also, see C6, L33-39, the resin used in the first and second optical layers is disclosed as polyethylene naphthalate

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(PEN), which is a polyester polymer and is therefore one of the polymers listed in the limitation of instant claim 11.)

Regarding claims 12-14, Nevitt et. al discloses all of the claimed limitations as set forth above.

Nevitt et. al does not explicitly disclose the following specific characteristics of the laminated film:

- longitudinal Young's modulus and transverse Young's modulus thereof are 2 to 7 GPa (claim 12)
- longitudinal heat shrinkage and transverse heat shrinkage thereof are 0% to 2% at 150°C (claim 13)
- longitudinal thermal expansion coefficient and transverse thermal expansion coefficient thereof are 3 to 45 ppm/°C. (claim 14)

However, in light of the substantially identical polymer type in the thermoplastic resin layer and the network structure-including layer, and the substantially identical liquid-crystal polymer composition and the substantially identical relative thicknesses of the thermoplastic resin layer and the network structure-including layer in the laminated film as taught by Nevitt et. al with the instant laminate film, it will, inherently, possess the claimed properties. See MPEP 2112.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 7-10 and 15-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nevitt et. al (U.S. 6,268,961) as applied to claim 1-6 and 11-14 above, and further in view of Ashcraft et. al (U.S. 4,377,616).

Regarding claims 7 and 8, Nevitt et. al discloses all of the claimed limitations as set forth above.

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Nevitt et. al also discloses that the particles can be made of liquid crystal polymers (C13, L1-L15).

Nevitt et. al does not disclose any limitation on the liquid crystal polymer content within the network structure-including film layer.

Ashcraft et. al does disclose a laminated film with a particular particle content.

(See C5, L62-C6, L15, the void initiating particles are disclosed as being present in a proportion of up to about 20% by weight of the core layer, which is the network structure-including layer. The upper endpoint of this disclosed range, about 20%, lies within the claimed range of instant claim 7. Example 4, C7, L42-58, the examples has a content of void initiating particles at 7 parts by weight per 92 parts by weight resin, which, when normalizing to wt%, is 7.07 wt% (i.e.  $(7/(92+7))*100$ ) and falls within the limitations for the liquid crystal polymer composition of instant claim 8.)

Ashcraft et. al further discloses that the void creating particles can be made of any material which can be formed into a sphere (C5, L65 - C6, L5). Also, the disclosed void containing coextruded and biaxially stretched film, having the above disclosed particle content, exhibits unexpectedly high stiffness (See C7, L1-5).

Since the instant specification is silent to unexpected results, the particle content in the network structure including layer is not considered to confer patentability to the

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claims. As the stiffness of the film is a variable that can be modified, among others, by adjusting the particle content in the network structure including layer, the particle content in the network structure including layer would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made.

As such, without showing unexpected results, the claimed particle content in the network structure including layer cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the particle content in the network structure including layer to obtain the desired stiffness of the film (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).)

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the laminated film, with particles of liquid crystal polymers, as taught by Nevitt et. al with the specific particle composition as taught by Aschcraft et. al for the purpose of imparting high stiffness in the laminated film (Aschcraft et. al C7, L1-5).

Regarding claims 9 and 10, Nevitt et. al discloses all of the claimed limitations as set forth above.

Nevitt et. al does not disclose the specific thickness limitations:

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- wherein the network structure-including film layer has a thickness equal to 1% to 90% of the thickness of the laminated film
- wherein the network structure-including film layer has a thickness equal to 10% to 80% of the thickness of the laminated film.

Ashcraft et. al does disclose a laminated film,

- wherein the network structure-including film layer has a thickness equal to 1% to 90% of the thickness of the laminated film
- wherein the network structure-including film layer has a thickness equal to 10% to 80% of the thickness of the laminated film.

(See Example 1, C6, L50-C7, L9. The thickness of the core layer, which is the layer with the void initiating particles and therefore the network structure-including film, is disclosed as being 40% of the total thickness of the laminate, which is within the limitations of instant claims 9 and 10.)

Ashcraft discloses that the void containing coextruded and biaxially stretched film, having the above disclosed network structure-including layer relative thickness, exhibits unexpectedly high stiffness (See C7, L1-5).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the laminated film as taught by Nevitt et. al with the relative layer thicknesses as taught by Ashcraft et. al for the purpose of imparting high stiffness in the laminated film (Ashcraft et. al C7, L1-5).

Regarding claim 15, modified Nevitt et. al discloses all of the claimed limitations as set forth above.

Modified Nevitt et. al does not disclose the laminated film having a density of between 0.2 and 1.2. However, in light of the substantially identical non-liquid crystal polyester composition, non-ductile resin composition and thickness, thermoplastic resin composition, and liquid crystal void initiating particle compositions in the laminated film as taught by modified Nevitt et al. with the instant laminated film, it will, inherently, possess the claimed properties. See MPEP 2112 (In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980)).

Regarding claims 16-27, Nevitt et. al discloses all of the claimed limitations as set forth above. Ashcraft et. al discloses all the claimed limitations as set forth above.

(For rejection of the limitations of claim 16-27 see rejection of claims 2 and 4-14 in the current office action respectively.)

Regarding claims 28 and 29, Nevitt et. al discloses all of the claimed limitations as set forth above.

Nevitt et. al does not disclose a method for creating cracks in the laminated film through biaxially stretching.

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Ashcraft et. al does disclose creating cracks in a laminated film through biaxially stretching.

(See C6, L25-40, the two layers are coextruded and then biaxially stretched to produce voids, which are initiated by void creating particles, (C3, L7-20). The voids are forms of cracks.)

Nevitt et. al also discloses a laminated film, wherein the thermoplastic resin composition is contained in layers placed on both faces of the non-ductile resin composition- containing layer.

(See rejection of claim 2 in the current office action)

Ashcraft discloses that the void containing coextruded and biaxially stretched film, having been produced by the above mentioned method, exhibits unexpectedly high stiffness (See C7, L1-5).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have produced the laminate film with the thermoplastic resin composition placed on both faces of the non-ductile resin composition- containing layer as taught by Nevitt et. al by coextruding the layers and then biaxially stretching the film in order to create voids as taught by Ashcraft et. al in order to impart high stiffness to the laminated film (Ashcraft et. al, C7, L1-5).

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Regarding claims 30 and 32, Nevitt et. al discloses all of the claimed limitations as set forth above. Ashcraft et. al discloses all the claimed limitations as set forth above.

It is known by those having ordinary skill in the arts at the time of the invention that the modified laminated film as taught by Nevitt et. al, being made of insulating polymers and having voids, would inherently be insulating by virtue of the insulating polymers or by the voids making up its structure, and would therefore meet the limitation of instant claim 32. Also, as an insulating material, it would be useable in the field of circuitry and is therefore also a circuit material, as in the limitation of instant claim 30.

11. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nevitt et. al (U.S. 6,268,961) as applied to claim 1-6 and 11-14 above, and further in view of Reinhart (U.S. 3,687,701).

Regarding claim 31, Nevitt et. al discloses all of the claimed limitations as set forth above.

Nevitt et. al does not disclose the use of the laminate as a release material.

Reinhart does disclose a thermoplastic resin used as a release material.

(See C1, L1-30, the removability of the paint from the thermoplastic resin makes the resin a release material.)

It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the laminate film with thermoplastic resin

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composition as taught by Nevitt et. al, as a release material as taught by Reinhart  
for the purposes of implementing the laminated film in a marketable application.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571)270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MN/

01/08/2008

/Basia Ridley/

Supervisory Patent Examiner, Art Unit 4145